

## REMARKS

### I. Introduction

Claims 1-4, 6, 7, 11-13, 15-17, 20, 21, 23-25 and 27-32 are currently pending in this application. Claim 13 has been amended, support for which can be found throughout the originally filed disclosure, in for example, Figs. 2A and 3A; page 16, line 12 - page 17, line 14; page 18, line 10 – page 19, line 11. No new matter has been added.

The pending claims were rejected under 35 U.S.C. § 103(a). Applicants respectfully reconsideration and request that for the following reasons the rejections should be withdrawn, the application allowed, and the case passed to issue.

### II. Claims Rejections Under 35 U.S.C. § 103(a)

#### A. **Akiyama in view of Brors and Kobayashi**

Claims 1, 24, 27, 28, 31 and 32 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama JP 2000-057640 in view of Brors U.S. Patent No. 4,169,031 and Kobayashi JP 56-152963. Applicants respectfully traverse the rejection.

Claims 1 and 24 each recite in pertinent part a configuration in which, “the annular-shaped magnetron magnet assemblies have progressively increasing diameters, and a distance between each sputtering surface and the at least one substrate/workpiece is *progressively larger*.”

Similarly, amended claim 13 now recites a method “wherein each annular-shaped magnetron magnet assembly has at least one progressively increasing diameter and a distance between each sputtering surface and the at least one substrate/workpiece is *progressively larger*.”

In order to establish a *prima facie* obviousness rejection under 35 U.S.C. § 103(a), basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must not be based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Further, "rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006).

The Examiner concedes at page 4 of the Office Action dated December 3, 2008 that Akiyama fails to disclose the shape of the annular magnetron assemblies or a distance between each sputtering surface and the at least one substrate is progressively larger, as recited in claims 1 and 24 and amended claim 13. Therefore, the Examiner relies on Brors and Kobayashi for allegedly ameliorating these deficiencies. Specifically, the Examiner asserts that Kobayashi allegedly teaches "changing the distance between the substrate and electrode in order to form more uniform films."

It is well established that, if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

As an initial matter, Akiyama not only does not teach or suggest a configuration in which "a distance between each sputtering surface and the at least one substrate/workpiece is

progressively larger,” as recited in claims 1, 13, and 24; Akiyama teaches away from any such configuration. Akiyama states in Para. [0026] of the computer translation:

In addition, distance between the targets 14 and substrates 16 in each membrane formation room was set to 70 mm (*emphasis added*).

As such, rather than teach or suggest any variation of distances between each sputtering surface and the substrate, Akiyama requires that these distances be fixed.

Furthermore, Brors also teaches away from any variation in the distances between each sputtering surface and the substrate. As Brors teaches clamping the cathode disc 24 via a clamping ring 22 to sputter deposit an electrically insulative material. See Brors col. 4, lines 36-48. Thus, the distance between each sputtering surface and the substrate is constant.

Furthermore, although Kobayashi speculates on changing various parameters of a sputtering device based on the desired ratio of the films, Kobayashi does not teach or suggest a configuration in which “a distance between each sputtering surface and the at least one substrate/workpiece is *progressively larger*.”

Moreover, as explained in the instant specification, arranging the device such that a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger, has the unexpected effect of creating a steeply inclined sputtered film profile, followed by a less steeply inclined sputtered film thickness and then an inverted steeply inclined sputtered film thickness. In this manner the sub-layers *collectively* form a substantially uniform thickness. See specification at page 16 line 23 to page 17, line 15.

Therefore, it is respectfully submitted that neither Akiyama, Brors nor Kobayashi, either alone or in combination do not disclose the same cathode sputter apparatus as recited in claims 1, 13 and 24.

Furthermore, a person having ordinary skill the art would not have combined these references at least because Akiyama and Brors *teach away* from varying the distance between each sputtering surface and the substrate.

Accordingly, it is respectfully requested that the rejection be withdrawn and claims 1, 13 and 24 be allowed.

Furthermore, claims 2-4, 6, 7, 11-12, 15-17, 20, 21, 23, 25 and 27-32 depend from and further define the subject matter of claims 1, 13 and 24 respectively and therefore should also be allowed.

**B. Akiyama in view of Brors and Hedgcoth and Kobayashi**

Claims 1-4, 6, 7, 13, 15-17, 20, 24, 25 and 27-32 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and further in view of Hedgcoth U.S. Patent No. 4,894,133 and Kobayashi. Applicants respectfully traverse the rejection.

As discussed above, in reference to the rejection under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and Kobayashi, claims 1 and 24 each recite in pertinent part a configuration in which, “the annular-shaped magnetron magnet assemblies have progressively increasing diameters, and a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger.”

Similarly, amended claim 13 now recites a method “wherein each annular-shaped magnetron magnet assembly has at least one progressively increasing diameter and a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger.” At a minimum, neither Akiyama, Brors nor Kobayashi, either alone or combination, teach these features as recited in the present claims 1, 13 and 24.

In fact, a person having ordinary skill in the art would not have found it obvious to combine the teaching of Akiyama and Brors, which require that the distances between each sputtering device and the substrate be at the same fixed distance, with the disclosure of Kobayashi.

The Examiner at pages 8 and 9 alleges that Hedgcoth teaches several features which are recited in the claims. However, at a minimum, it is clear that Hedgcoth does not teach or suggest “a distance between each sputtering surface and the at least one substrate/workpiece is *progressively larger*,” as recited in claims 1, 13 and 24.

Rather, Figs. 1 and 2 of Hedgcoth show a group of cathode/target assemblies in which the distance between the sputtering surface of each cathode/target assembly and the substrate remains *constant*. The target source to substrate distance is preferably maintained within a range of 2 to 4 inches. Hedgcoth states in col. 4, lines 55-56:

*The target dimensions are approximately the same as the nucleating targets 42 (emphasis added).*

Thus, Hedgcoth fails to disclose or suggest, at a minimum, a distance between *each* sputtering surface and the at least one substrate/workpiece is *progressively larger*, as required by claims 1, 13 and 24.

Further, contrary to the Examiner’s assertion, Hedgcoth does not discuss depositing a *perpendicular* magnetic recording medium on a magnetically soft underlayer. Hedgcoth describes a cobalt/nickel alloy source, not a *perpendicular* magnetic recording medium in the section cited by the Examiner. Hedgcoth fails to disclose or remotely suggest, at a minimum, transporting at least one substrate for a perpendicular magnetic recording medium, as required in independent claim 13. Thus, Hedgcoth fails to cure the deficiencies of Akiyama and Brors and Kobayashi.

Accordingly, claims 1, 13 and 24 are allowable over the cited prior art references, and therefore should be allowed.

Furthermore, Furthermore, claims 2-4, 6, 7, 11-12, 15-17, 20, 21, 23, 25 and 27-32 depend from and further define the subject matter of claims 1, 13 and 24 respectively and therefore should also be allowed

**C. Akiyama in view of Brors and further in view of Hedgcoth and Kobayashi and further in view of Mukai.**

Claims 12 and 21 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and further in view of Hedgcoth and Kobayashi and further in view of Mukai U.S. Patent No. 5,441,615. Applicants respectfully disagree.

As discussed above, in reference to the rejection under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and Hedgcoth and Kobayashi, claim 1 recites in pertinent part a configuration in which, “the annular-shaped magnetron magnet assemblies have progressively increasing diameters, and a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger.”

Similarly, amended claim 13 now recites a method “wherein each annular-shaped magnetron magnet assembly has at least one progressively increasing diameter and a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger.”

At a minimum, neither Akiyama, Brors, Hedgcoth nor Kobayashi, either alone or combination, teach these features as recited in the present claims 1 and 13. In fact, a person having ordinary skill in the art would not have found it obvious to combine the teaching of

Akiyama or Brors or Hedgcoth, which require that the distances between each sputtering device and the substrate be at the same fixed distance, with the disclosure of Kobayashi.

The Examiner at page 10 of the Office Action dated December 3, 2008 asserts that none of Akiyama or Brors or Hedgcoth or Kobayashi teach the use of shield members as recited in claim 12 and 21 and therefore relies on Mukai for this alleged disclosure.

However, at a minimum, Mukai fails to cure the deficiencies of Akiyama, Brors, Hedgcoth and Kobayashi, at least because, Mukai also fails to teach or suggest “a distance between *each* sputtering surface and the at least one substrate/workpiece is *progressively larger*,” as required by claims 1 and 13.

In contrast, to the above excerpted claim feature, Mukai fails to disclose such a configuration.

Thus, Mukai fails to cure the deficiencies of Akiyama and Brors and Hedgcoth and Kobayashi.

Accordingly, claims 1 and 13 are allowable over the cited prior art references, and therefore should be allowed.

Furthermore, claims 12 and 21 depend from and further define the subject matter of claims 1 and 13 respectively and therefore should also be allowed.

**D. Akiyama in view of Brors and further in view of Hedgcoth**

Claim 23 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and further in view of Hedgcoth and further in view of Nasu U.S. Patent No. 5,326,637. Applicants respectfully disagree with the rejection.

As discussed above, in reference to the rejection under 35 U.S.C. § 103(a) as allegedly being unpatentable over Akiyama in view of Brors and Hedgcoth and Kobayashi, amended claim 13 now recites a method “wherein each annular-shaped magnetron magnet assembly has at least one progressively increasing diameter and a distance between each sputtering surface and the at least one substrate/workpiece is progressively larger.”

At a minimum, neither Akiyama, Brors, Hedgcoth nor Kobayashi, either alone or combination, teach these features as recited in the present claim 13.

Indeed, it is respectfully submitted that a person having ordinary skill in the art would not have found it obvious to combine the teaching of Akiyama or Brors or Hedgcoth with the disclosure of Kobayashi because each of Akiyama, Brors and Hedgcoth teach away from changing the distances between each sputtering device and the substrate.

The Examiner at page 11 asserts that Nasu teaches a magnetic soft under layer can be Fe, Fe-Co.

However, at a minimum, Nasu fails to cure the deficiencies of Akiyama, Brors, Hedgcoth and Kobayashi, at least because, Nasu also fails to teach or suggest a “a distance between *each* sputtering surface and the at least one substrate/workpiece is *progressively larger*,” as required by claims 1, 13 and 24.

In contrast, to the above excerpted claim feature, Nasu fails to disclose such a configuration.

Thus, Nasu fails to cure the deficiencies of Akiyama and Brors and Hedgcoth and Kobayashi.

Accordingly, claim 13 is allowable over the cited prior art references, and therefore should be allowed.



Furthermore, claim 23 depend from and further define the subject matter of claim 13 and therefore should also be allowed.

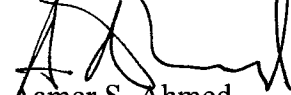
### **III. Conclusion**

In view of the above amendments and remarks, Applicants respectfully submit that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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